

Claims

What is claimed is:

- 1 A process for recovering copper from a copper-containing material, comprising the steps of:
 - a) pressure leaching a copper-containing material with a liquid to yield a residue and a copper-containing solution;
 - b) diluting said copper-containing solution with a diluting solution to form a diluted copper-containing solution, wherein a ratio of said copper-containing solution to said diluting solution is less than about 1:10 and the pH of said diluted copper containing solution is less than about 2.2; and
 - c) solvent extracting said copper from said diluted copper-containing solution.
2. The process of claim 1, wherein in said diluting step, the ratio by volume of said copper-containing solution to said diluting solution ranges from about 1:4 to about 1:8.
3. The process of claim 2, further comprising providing an extraction reagent for use in said step of solvent extracting said copper from said diluted copper-containing solution.
4. The process of claim 3, wherein said step of providing an extraction reagent comprises providing an aldoxime/ketoxime mixture.
5. The process of claim 3, wherein said step of providing an extraction reagent comprises providing an extraction reagent comprising aldoximes, modified aldoximes, or aldoxime/ketoxime mixtures.
6. The process of claim 2, wherein said pressure leaching step comprises high temperature pressure leaching at a temperature from about 210°C to about 235°C.

7. The process of claim 6, wherein said pressure leaching step is. The process of claim 8, wherein said comminuting step comprises comminuting said copper-containing material to a P80 of less than about 75 microns. s at superatmospheric pressure at a temperature of about 225°C in an oxygen-containing atmosphere.
8. The process of claim 2, further comprising the step of comminuting said copper-containing material prior to the step of pressure leaching.
9. The process of claim 8, wherein said comminuting step comprises comminuting said copper-containing material to a P80 of less than about 75 microns.
10. The process of claim 2, further comprising the step of recovering any precious metals contained in said pressure leaching residue.
11. The process of claim 2, further comprising the step of electrowinning said copper from said solvent extraction step to form cathode copper.
12. The process of claim 1, wherein in said solvent extracting step, said diluted copper-containing solution is contacted with an extraction reagent comprising an aldoxime/ketoxime mixture.

13. A copper recovery process comprising the steps of:
- a) providing a copper sulfide-bearing material;
 - b) comminuting said copper sulfide-bearing material to provide a comminuted copper sulfide-bearing material in a slurry form;
 - c) subjecting said slurry to flotation to separate copper sulfide-bearing materials and to form a concentrated copper sulfide-bearing material;
 - d) pressure leaching said concentrated copper sulfide-bearing material at a temperature in the range of about 210°C to about 235°C in an oxygen-containing atmosphere in a sealed, agitated multiple-compartment pressure leaching vessel to form a product slurry;
 - e) separating said product slurry into a copper-containing solution and a solids-containing residue;
 - f) adjusting the pH of said copper-containing solution to a pH of less than about 2.2 by combining said copper-containing solution with a make-up diluting solution to yield a pH-adjusted copper-containing solution, wherein the ratio of said copper-containing solution to said make-up diluting solution is in the range of from about 1:4 to about 1:8;
 - g) solvent extracting and electrowinning said pH adjusted copper-containing solution to yield a raffinate solution and copper cathode;
 - h) applying said acid-containing raffinate solution in a heap leaching operation.
14. The process of claim 13, further comprising the step of subjecting said residue of step (e) to a further processing.
15. The process of claim 14, wherein said step of further processing comprises precious metal recovery.
16. The process of claim 14 wherein said step of further processing comprises impounding.

17. The process of claim 13, wherein in said solvent extracting step, said pH-adjusted copper-containing solution is contacted with an extraction reagent comprising an aldoxime/ketoxime mixture.

18. The process of claim 13, wherein said step of adjusting the pH of said copper-containing solution comprises combining said copper-containing solution with a make-up diluting solution to yield a pH-adjusted copper-containing wherein the ratio of said copper-containing solution to said make-up diluting solution is in the range of from about 1:4 to about 1:8 and the pH of said pH-adjusted copper-containing solution is from about 1.4 to about 1.8.

19. In a process for recovering copper from a copper-containing material comprising the steps of pressure leaching a copper-containing material with a liquid to yield a residue and a copper-containing solution, wherein the copper in said copper-containing solution is recovered through solvent extraction of the copper from the copper-containing solution, the process being improved wherein the copper-containing solution is diluted prior to solvent extraction in a diluting step, and the ratio by volume of the copper-containing solution to the diluting solution is less than about 1:10.

20. The process of claim 19 wherein in said diluting step the ratio by volume of the copper-containing solution to the diluting solution ranges from about 1:4 to about 1:8.